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| 10/576,421 | 04/19/2006 | Tetsuya Hayashi | 043888-0447 | 9484 |

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EXAMINER

RADEMAKER, CLAIRE L

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| ART UNIT | PAPER NUMBER |
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1795

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01/09/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|---------------------------------|--------------------------------|--|
| Office Action Summary | Application No. 10/576,421 | Applicant(s) HAYASHI ET AL. | |
| | Examiner Claire L. Rademaker | Art Unit 1795 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>4/19/2006</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. Figures 5-6 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated (Specification, paragraphs [0005]-[0011]). See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3-5, and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizutani (US 2003/0180605) in view of Reichert et al. (US 6,217,623) and Tsukamoto et al. (US 6,022,642).

With regard to claims 1 and 3-4, Mizutani et al. teaches a lithium ion secondary battery (paragraphs [0037]-[0038]; Figure 1) including an electrode group that comprises:

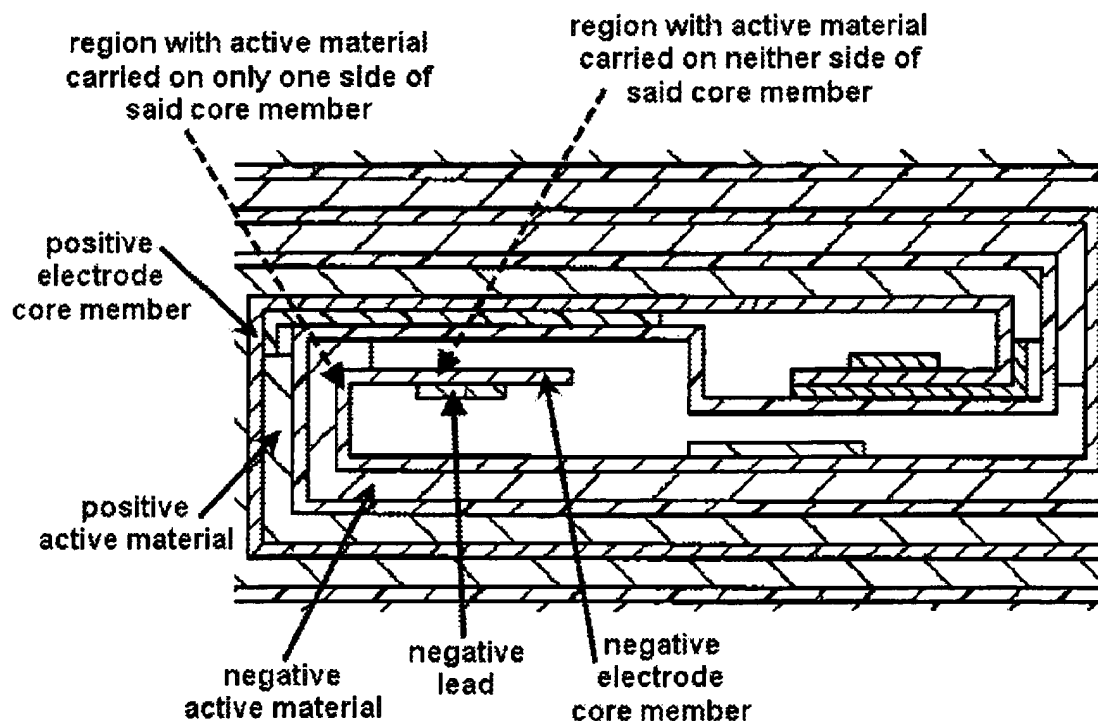
a positive electrode comprising a positive electrode core member (15, paragraph [0044]; Figure 1) and a positive electrode active material layer (2, paragraphs [0038] & [0044]; Figure 1) carried on said positive electrode core member (paragraph [0044]; Figure 1),

a negative electrode comprising a negative electrode core member (16, paragraph [0047]; Figure 1) and a negative electrode active material layer (3, paragraph [0038]; Figure 1) carried on said negative electrode core member (paragraphs [0038] & [0047]; Figure 1),

a porous film (1, paragraphs [0038] & [0050]; Figure 1) disposed between said positive electrode and said negative electrode (paragraph [0038]; Figure 1), wherein said positive electrode and said negative electrode are wound (paragraph [0038]; Figure 1), and wherein said negative electrode has, on the initial winding side, a region where said negative electrode active material layer is carried on neither side of said core member (paragraph [0056]; Figure 1) and an adjoining region where said active material layer is carried on only one side of said core member (paragraph [0038]; Figure 1), and

a lead (9, paragraphs [0038] & [0056]; Figure 1) provided in the region of negative electrode where the active material layer is carried on neither side of said core member (9, paragraphs [0038] & [0056]; Figure 1).

The following illustration (modification of Mizutani Figure 1) is provided for clarification:



Mizutani fails to teach the specified composition of the porous film layer.

Reichert et al. teaches a porous film layer (26, col. 3, lines 23-25 & 34-41 & col. 5, lines 32-39; Figures 1-2) comprising a filler and a binder (col. 5, lines 32-39) in order to allow the porous film layer to be sprayed directly onto an anode or/and a cathode (col. 5, lines 32-39),

It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the porous film layer of Mizutani with the porous film layer of Reichert et al. in order to allow the porous film layer to be sprayed directly onto an anode or/and a cathode (col. 5, lines 32-39).

Modified Mizutani also fails to teach a winding core with a recess at a specified position.

Tsukamoto et al. teaches the concept of a winding core (1, paragraph [0013]; Figures 2), wherein the initial winding side of said winding core has a recess at a position where it comes into contact with the starting position of the active material layer of the inner electrode (paragraphs [0016]-[0017]; Figure 2), and said recess corresponds to at least a part of the thickness of said inner electrode (paragraphs [0016]-[0017]; Figure 2) in order to reduce or eliminate the level difference caused by the inner electrode thickness and thereby create a reliable battery (paragraphs [0006] & [0020]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the winding core with a recess at a position where it comes into contact

with the starting position of the active material layer of the inner electrode of Tsukamoto et al. to the lithium ion secondary battery of modified Mizutani et al. in order to reduce or eliminate the level difference caused by the inner electrode thickness and thereby create a reliable battery (paragraphs [0006] & [0020]).

With regard to claims 5 and 7-8, Mizutani et al. teaches a method for producing a lithium ion secondary battery (paragraphs [0058]-[0071]) comprising the steps of:

(a) forming a positive electrode active material layer (2, paragraphs [0038] & [0044]; Figures 1 & 4) on both sides of a positive electrode core member (15, paragraph [0044]; Figures 1 & 4) to obtain a positive electrode (paragraph [0044]; Figure 4),

(b) forming a negative electrode active material layer (3, paragraph [0038]; Figures 1 & 5) on both sides of a negative electrode core member (16, paragraph [0047]; Figures 1 & 5) to obtain a negative electrode (paragraph [0047]; Figure 5),

(c) forming a porous film (1, paragraphs [0038] & [0050]; Figure 1) on a surface of said positive electrode and said negative electrode (paragraphs [0066]-[0068] & [0038]; Figures 7A-7D)

(d), winding said positive electrode and said negative electrode with a porous film inbetween said positive and negative electrodes to obtain an electrode group (paragraphs [0068]-[0069]; Figures 7A-7D), and

(e) welding a lead to said region of said positive electrode and said negative electrode where the active material layer is carried on neither side of said core member (paragraphs [0055]-[0056]; Figures 1 & 4-5),

wherein said steps (a) and (b) comprise the step of providing, on the initial winding side of said positive electrode and said negative electrode, a region where said active material layer is carried on neither side of said core member (paragraph [0056]; Figure 1) and an adjoining region where said active layer is carried on only one side of said core member (paragraph [0038]; Figure 1), but fails to teach the specified composition of the porous film layer.

Reichert et al. teaches a porous film layer (26, col. 3, lines 23-25 & 34-41 & col. 5, lines 32-39; Figures 1-2) comprising a filler and a binder (col. 5, lines 32-39) in order to allow the porous film layer to be sprayed directly onto an anode or/and a cathode (col. 5, lines 32-39).

Reichert et al. and Mizutani are considered analogous art because they involve the same field of endeavor: secondary batteries.

It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the porous film layer of Mizutani with the porous film layer of Reichert et al. in order to allow the porous film layer to be sprayed directly onto an anode or/and a cathode (col. 5, lines 32-39).

Modified Mizutani also fails to teach the concept of a winding core with a recess at a specified position.

Tsukamoto et al. teaches the concept of a winding core (1, paragraph [0013]; Figures 2), wherein the initial winding side of said winding core has a recess at a position where it comes into contact with the starting position of the active material layer of the inner electrode (paragraphs [0016]-[0017]; Figure 2), and said recess

corresponds to at least a part of the thickness of said inner electrode (paragraphs [0016]-[0017]; Figure 2) in order to reduce or eliminate the level difference caused by the inner electrode thickness and thereby create a reliable battery (paragraphs [0006] & [0020]).

Tsukamoto et al. and Mizutani are considered analogous art because they involve the same field of endeavor: secondary batteries.

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the winding core with a recess at a position where it comes into contact with the starting position of the active material layer of the inner electrode of Tsukamoto et al. to the lithium ion secondary battery of modified Mizutani et al. in order to reduce or eliminate the level difference caused by the inner electrode thickness and thereby create a reliable battery (paragraphs [0006] & [0020]).

5. Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizutani (US 2003/0180605), Reichert et al. (US 6,217,623), and Tsukamoto et al. (US 6,022,642), as applied to claims 1 and 5 above, respectively, and further in view of Komatsu et al. (US 2002/0146626).

The disclosure of Mizutani, Reichert et al., and Tsukamoto et al. as discussed above is fully incorporated herein.

With regard to claims 2 and 6, modified Mizutani fails to teach a separator disposed between said positive electrode and said negative electrode, wherein the resulting product is wound.

Komatsu et al. teaches the a separator (31, paragraphs [0039]-[0040]; Figures 3 & 5) disposed between positive (10, paragraph [0040]; Figure 5) and negative (20, paragraph [0040]; Figures 3 & 5) electrodes (paragraphs [0039]-[0040]; Figures 3 & 5) where a porous film (33, 41; paragraphs [[0039]-[0040]; Figures 3 & 5) is also disposed between positive (10, paragraph [0040]; Figure 5) and negative (20, paragraph [0040]; Figures 3 & 5) electrodes (paragraphs [0039]-[0040]; Figures 3 & 5), wherein the resulting product is wound (paragraph [0041]), in order to bond the electrode(s) to the separator, maintain a constant distance between the electrodes, and avoid capacity drop after repeated charges/discharges (paragraph [0045]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the separator of Komatsu et al. to the lithium ion secondary battery of modified Mizutani et al. in order to bond the electrode(s) to the separator, maintain a constant distance between the electrodes, and avoid capacity drop after repeated charges/discharges (paragraph [0045]).

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Claire L. Rademaker whose telephone number is 571-

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272-9809. The examiner can normally be reached on Monday - Friday, 8:00AM - 4:30PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CLR



ALEXA D. NECKEL
SUPERVISORY PATENT EXAMINER